भारतीय मानक

Indian Standard

IS 4161 : 2023

नेस्लर सिलेंडर — विशिष्टि

(पहला पुनरीक्षण)

Nessler Cylinder — Specification

(First Revision)

ICS 71.040.20

BIS 2023

भारतीय मानक ब्यूरो
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February 2023 **Price Group 4**

Glass, Glassware & Laboratoryware Sectional Committee, CHD 10

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Glass, Glassware and Laboratory ware Sectional Committee had been approved by the Chemical Division Council.

This standard covers Nessler cylinders normally used in scientific and industrial laboratories. Nessler cylinders are suitable for use in laboratories for comparing the colour of lightly coloured liquids.

This standard was originally published in 1967. In this first revision, the requirements for nominal capacity of 25 ml has been added, the references have been updated and a test method for nominal capacity has been added. The sampling plan has also been modified by referring to the IS 4426. Several editorial changes as per the latest standard format have also been incorporated.

The composition of the Committee responsible for development of this standard is listed in Annex A.

For the purpose of deciding whether a requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

NESSLER CYLINDER — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and methods of test for Nessler cylinders used in laboratories for comparing the colour of light coloured liquids.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of and necessary adjuncts to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

IS No.	*Title*
IS 1382 : 1981	Glossary of terms relating to glass and glassware (*first revision*)
IS 2303 (Part 1/Sec 1) : 2021	Grading glass: Part 1 Method of test and classification: Sec 1 Hydrolytic resistance of glass grains at 98 °C (*third revision*)
IS 4426 : 1992	Methods of sampling laboratory glassware (*first revision*)
IS/ISO 4787 : 2010	Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1382 : 1981, in addition to the following, shall apply:

3.1 Capacity — The volume of water at 27 °C in millilitres contained in the cylinder at 27 °C when filled to the graduation line indicating nominal capacity, the lowest point of the meniscus being in the horizontal plane conforming to the top edge of the graduation line, with the cylinder in a vertical position.

4 REQUIREMENTS

4.1 Nominal Capacity

The Nessler cylinders shall be of the following three capacities:

a) 25 ml;

b) 50 ml; and

c) 100 ml.

4.1.1 *Tolerance on Nominal Capacity* — The maximum error in capacity for 25 ml cylinder shall not exceed ± 0.2 ml. The maximum error in capacity for 50 ml cylinder shall not exceed ± 0.4 ml. The maximum error in case of 100 ml cylinder shall not exceed ± 0.8 ml at either of the graduation lines and the difference between errors at the 50 ml and 100 ml lines shall not exceed 0.8 ml, when measured in accordance with IS/ISO 4787.

4.2 Material and Workmanship

4.2.1 The cylinders shall be made of transparent glass as free as possible from strains and visible defects. They shall be well annealed.

4.2.2 The glass used shall be sufficiently free from colour to render it suitable for the colorimetric observations.

4.3 Construction and Finish

4.3.1 The cylinders shall be either mouth blown or made from glass tubing of as uniform a bore as possible. Each cylinder shall be finished at the top with a smooth fire-polished edge which may be strengthened by a slight beading, if desired. A small pouring lip shall be provided so-that the liquid does not cling to the sides of the cylinder while pouring.

4.3.2 The base of the cylinder shall be flat and polished on the outside and shall be such that the cylinder shall stand vertically on a level surface without rocking. On the inside, the junction between the walls and the base shall be such that the inside of the base is parallel to the outside over largest practicable area.

4.3.3 When the cylinder is made from glass tubing the base shall either be formed from the tubing of which the body is made or shall be a glass disc permanently fused to the tube in a manner which precludes the possibility of liquid penetrating into the joint.

4.4 Dimensions — Nessler cylinders shall conform to the dimensions specified in Table 1.

NOTE — The tolerances on the heights to the graduation lines are adequate to allow for normal variations in manufacture. More stringent tolerances are not practicable. It is not possible, however, to use side by side Nessler cylinders differing from each other in height of graduation line by more than about 1 mm. Consequently in fulfilling any particular order, manufacturers or suppliers are expected to select from their stock, cylinders which agree satisfactorily with each other in height of graduation mark.

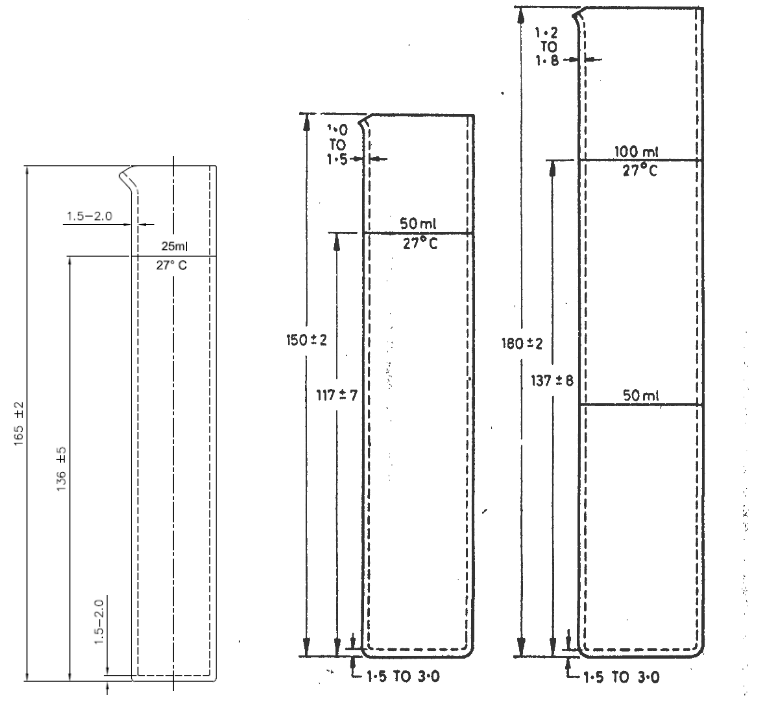
Table 1 Dimensions of Nessler Cylinders
(*Clause* 4.4)

Sl No.	Details	Nominal Capacity, ml		
		25	50	100
(1)	(2)	(3)	(4)	(5)
i)	Overall height, mm	165 ± 2	150 ± 2	180 ± 2
ii)	External height to 25 ml mark, mm	136 ± 5	—	—
iii)	External height to 50 ml mark, mm	—	117 ± 7	69 ± 8
iv)	External height to 100 ml mark, mm	—	—	137 ± 8
v)	Thickness of wall, mm	1.5 to 2.0	1.0 to 1.5	1.2 to 1.8
vi)	Thickness of base, mm	1.5 to 2.0	1.5 to 3.0	1.5 to 3.0

4.5 Graduation Lines and Numbering

4.5.1 The cylinders of nominal capacity 25 ml, 50 ml shall have a graduation line corresponding to 25 ml, 50 ml respectively and the cylinder of nominal capacity 100 ml shall have graduation lines corresponding to 50 ml and 100 ml.

4.5.2 The graduation lines shall be clean permanent lines of uniform thickness not exceeding 0.3 mm lying in planes at right angles to the axis of the cylinder and horizontal when the cylinder is standing on a level surface. Each graduation line shall be carried completely round the cylinder and appropriately numbered as shown in Fig. 1.



All dimensions in millimetres

FIG. 1 NESSLER CYLINDER

4.6 Limit of Alkalinity — When graded according to the method prescribed in IS 2303 (Part 1/Sec 1) : 2021, it shall conform to Class HGB 1.

5 MARKING AND PACKING

5.1 Marking

5.1.1 The following inscriptions shall be permanently and legibly marked on the Nessler cylinders.

a) Nominal capacity followed by the abbreviation ‘ml’;
b) The abbreviation ’27 °C’ to indicate the standard temperature at which it is calibrated; and
c) Maker's name or recognized trade-mark, if any.

5.1.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

5.2 Packing

Nessler cylinders shall be packed as agreed to between the purchaser and the supplier.

6 SAMPLING

6.1 Representative samples of Nessler cylinders shall be drawn and adjudged as prescribed in IS 4426.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Glass, Glassware and Laboratoryware Sectional Committee, CHD 10

Organization	*Representative(s)*
CSIR - Central Glass and Ceramic Research Institute, Kolkata	DR SUMAN KUMARI MISHRA (***Chairperson***)
AGI Glaspac, Gurugram	SHRI RAJESH KHOSLA SHRI VISHWANATH AMBADIPUDI (*Alternate*)
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Shree Labware and Process Systems, Bengaluru	SHRI A. N. S. KUMAR
SISECAM Flat Glass India Pvt Ltd, Halol	SHRI PARAG SHAH SHRI PANKAJ NUWAL(*Alternate*)
The All India Glass Manufacturers Federation, New Delhi	SHRI SOURABH KANKAR SHRI VINIT KAPUR (*Alternate*)
Voluntary Organization in Interest of Consumer Education (VOICE), New Delhi	SHRI B. K. MUKHOPADHYAY SHRI K. C. CHAUDHARY (*Alternate*)
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Omsons Glassware Pvt Ltd, Ambala	SHRI RAJESH SHARMA
Shree Labware and Process Systems, Bengaluru	SHRI A. N. S. KUMAR

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